



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/740,661 | 12/18/2000 | Hong Zhang | 22271-05234 | 3497 |

758 7590 05/19/2004

FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

EXAMINER

PATEL, HARESH N

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2154

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/740,661

Applicant(s)

ZHANG ET AL.

Examiner

Haresh Patel

Art Unit

2154

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

1. Claims 1-35 are presented for examination.

Response to Amendments

2. Applicant's arguments with respect to claims 1-35 have been considered but are moot in view of the new ground(s) of rejection necessitated by Applicant's amendments to the claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 5, 6, 9, 11, 13, 18-22, 31, 33-35, are rejected under 35 U.S.C. 103(a) as being unpatentable over Blais et. al 6,505,344 (Hereinafter Blais) in view of "Official Notice".

5. As per claims 1, 9, 18, 33, 34 and 35, Blais teaches the following:

a computer implemented method / computer readable medium / system of allocating stack memory for a process for executing a computer program code (e.g., method allocating stack from heap or method's stack, abstract), the method comprising:

mapping an active session to a thread for execution (e.g., execution of a segment of the code containing calls for no escape, global escape and arg escape, abstract), the thread having a first stack memory (e.g., heap, abstract) selected to execute a first class of code associated with a

Art Unit: 2154

first predetermined stack memory requirement (e.g., determination of whether to use the heap, abstract), the first stack memory corresponding to the pre-determined stack memory requirement (e.g., an allocation instruction defining global escape for heap allocation, abstract);

responsive to a code segment of the code being of the first class, executing the code segment with the first stack memory (e.g., using the heap for executing the segment of the code, abstract); and

responsive to the code segment being of a second class of code (e.g., segment of the code calling method's invocation stack frame, abstract) associated with a second pre-determined stack memory requirement (e.g., determination of whether to use the method's stack, abstract) executing the code segment in an auxiliary stack memory corresponding to the second stack memory requirement to execute the code segment (e.g., using the method's stack for executing the segment of the code, abstract).

first pre-determined stack memory requirement (e.g., pre-determined use of heap, abstract),

second pre-determined stack memory requirement (e.g., pre-determined use of method's stack, abstract),

prior to execution of the functions calls of the program code (e.g., segment of the code containing stack selection, i.e., heap or method's stack, calls, abstract),

default stack (e.g., heap stack, abstract),

wrapper (e.g., use of classes, java objects, col., 2, lines 29 – 59),

operating system for concurrent executing a plurality of user session request (e.g., any computer system, regardless of whether the computer system having an operating system is a

Art Unit: 2154

complicated multi-user computing apparatus, a single user workstation, or an embedded control system, col., 17, lines 45 – 65).

Blais teaches about the garbage collection to reclaim the stack memory related to the execution of the segment of the code for stack assignment. Blair also teaches that the secondary stack, i.e., method's stack can be of any size. However, Blair does not specifically mention about reclaiming the auxiliary stack memory and that a second pre-determined stack memory requirement is greater than the first stack memory requirement. "Official Notice" is taken that both the concept and advantages of reclaiming the auxiliary stack memory and that a second pre-determined stack memory requirement is greater than the first stack memory requirement is well known and expected in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include reclaiming the auxiliary stack memory and that a second pre-determined stack memory requirement is greater than the first stack memory requirement with the teachings of Blais in order to facilitate to use auxiliary stack for the larger memory requirement and recovering of the secondary stack space after it has been used. Having secondary stack larger than a heap stack would help provide segment of the code that needs bigger stack space than the heap size. As per the Blais teachings, the code will be design such that the stack program calls will use the secondary stack whenever the bigger stack is necessary for execution. The well-known concept of recovering the stack space after use will be performed on the secondary stack to reclaim the used stack during execution.

6. As per claims 2, 5, 6, 11, 13, 19, 20, 21, 22, 31, Blais teaches the following:

Art Unit: 2154

the code segment includes a function call and code segments of the second class include a wrapper configured to call the auxiliary stack memory to execute the function call (e.g., use of classes, java objects, to make calls for the secondary stack, col., 2, lines 29 – 59, abstract),

allocating a preselected stack memory space for the auxiliary stack memory (e.g., allocating known memory space that is used for method's stack, abstract),

auxiliary stack memory is a shared stack (e.g., method's stack obtained from a memory allocation which is shared by other tasks, col., 2, lines 29 – 59, abstract),

wrapping the program code in a wrapper to transfer the execution to the auxiliary stack memory (e.g., use of classes, java objects, to make calls to select the secondary stack instead of the heap stack, col., 2, lines 29 – 59, abstract),

selecting the stack memory allocated to the thread sufficient to handle a first class of function calls (e.g., use of classes, java objects, to make calls to select the heap stack instead of the secondary stack, col., 2, lines 29 – 59, abstract),

the step of selecting the size of the auxiliary stack memory sufficient to handle a second class of function calls (e.g., use of classes, java objects, to make calls to select the secondary stack instead of the heap stack, col., 2, lines 29 – 59, abstract),

the auxiliary stack memory is a new stack from a memory pool (e.g., method's stack obtained from a memory allocation which is shared by other tasks, col., 2, lines 29 – 59, abstract),

allocating the stack memory for the auxiliary stack memory space as required to satisfy the stack memory requirements of the function call (e.g., use of secondary stack of the memory

Art Unit: 2154

allocation based on the need of the necessity of the segment of the code for execution, col., 2, lines 29 – 59, abstract),

forming a shared stack as the auxiliary stack memory (e.g., use of secondary stack from the shared memory pool, col., 2, lines 29 – 59, abstract),

characterizing at least one function by running the function on a real or virtual system to determine the stack memory required to execute the function (e.g., any computer system, regardless of whether the computer system having an operating system is a complicated multi-user computing apparatus, a single user workstation, or an embedded control system, col., 17, lines 45 – 65).

7. Claims 3, 4, 7, 8, are rejected under 35 U.S.C. 103(a) as being unpatentable over Blais in view of “Official Notice” and Nilsen et. al. 6,081,665 (Hereinafter Nilsen).

8. As per claims 3, 4, 7, 8, Blais teaches the claimed limitation as rejected under claim 1. Blais also teaches use of wrapper and minor detailed operations of saving a stack pointer to the stack; resetting the stack pointer to the shared stack; copying arguments from the one stack to the shared stack; calling a program function of the function call; returning the result to the stack of the thread; returning the shared stack (e.g., col., 5, line 47 – col., 6, line 47). Blais also teaches about the code types are identified by a naming convention (e.g., use of classes, java objects, col., 2, lines 29 – 59). However, Blais does not specifically mention about the thread being non-preemptive or preemptive or whether the code is blockable or non-blockable.

It is well known in the prior art, for example, Nilsen teaches the concept of the use of thread being preemptive or non-preemptive and whether the code is blockable or non-blockable

Art Unit: 2154

(e.g., Use of ClearPreemptionFlag(), SetPreemptionFlag() function calls, blockable calls, etc, figures 42, 43, 47 – 52).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blais and Nilen to implement stack usage for a preemptive or non-preemptive thread and blockable/non-blockable code. The well-known concept of using the preemptive or non-preemptive thread function calls will provide segment of the code to utilize the stack memory space to process the execution of the code for blockable or non-blockable code, as suggested by Nilsen.

9. Claims 10, 12, 14-17, 23 – 30 and 32, are rejected under 35 U.S.C. 103(a) as being unpatentable over Blais in view of “Official Notice” and Nilsen.

10. As per claims 10, 12, 14-17, 23 – 30 and 32, refer to claims 3, 4, 6-8, for rejection and combination of references.

Conclusion

11. The attached (form PTO-892) cited references are made of record and not relied upon is considered pertinent to applicant’s disclosure. The cited references also teach the claimed subject matter.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2154

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Haresh Patel whose telephone number is (703) 605-5234. The examiner can normally be reached on Monday, Tuesday, Thursday and Friday from 10:00 am to 8:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee, can be reached at (703) 305-8498.

The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Haresh Patel

May 11, 2004



JOHN FOLLANSBEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100